In the claims:

Please amend the claims as shown below:

1. (Currently amended) A grinding apparatus for grinding the working tips of hard metal inserts of rock drill bits, comprising:

~~said grinding apparatus having~~ a grinding machine,

means for holding the rock drill bits to be ground and a support system, ~~said~~

the support system ~~including~~ having means ~~to provide~~ for providing a controlled variable feed pressure ~~for said grinding machine~~ during grinding,

~~said~~ the grinding machine ~~adapted to be~~ equipped with a spindle assembly having an output drive shaft having a longitudinal axis, grinding tools of different sizes and profiles detachably connected to the output drive shaft for grinding different sizes and profiles of working tips and means for varying and controlling a speed of rotation of the output drive shaft during grinding based on a size of a connected grinding tool.

2-38. (Canceled)

39. (New) The grinding apparatus according to claim 1 wherein the grinding machine has an electric motor.

40. (New) The grinding apparatus according to claim 39 wherein a frequency inverter is provided between the electric motor and an electric power source to vary the rotational speed of the output drive shaft.

41. (New) The grinding apparatus according to claim 39 wherein the electric motor is water-cooled.

42. (New) The grinding apparatus according to claim 1 wherein the grinding tool is a grinding cup.

43. (New) The grinding apparatus according to claim 1 wherein a rotation motor and bearing arrangement are provided on the support system of the grinding apparatus for providing an orbital rotation to the grinding machine around a longitudinal axis of the hard metal inserts.

44. (New) The grinding apparatus according to claim 40 wherein the frequency inverter is a compact solid-state frequency inverter.

45. (New) The grinding apparatus according to claim 40 wherein the frequency inverter is a spindle brake to enable the grinding tool to be aligned and attached to the output drive shaft.

46. (New) The grinding apparatus according to claim 1 wherein the grinding apparatus has a self-centering grinding machine and the support system permits movement of the grinding machine horizontally and vertically.

47. (New) The grinding apparatus according to claim 46, wherein the support system has means for providing a balance pressure when the grinding machine is not in use and means for providing the feed pressure when in use.

48. (New) The grinding apparatus according to claim 47, wherein the means for providing a balance pressure and the means for providing the feed pressure are adapted to produce the balance pressure and the feed pressure independently.

49. (New) The grinding apparatus according to claim 48 wherein the means for providing the feed pressure limits a maximum

movement of the grinding tool.

50. (New) The grinding apparatus according to claim 49 wherein the grinding apparatus has a separate short stroke cylinder.

51. (New) The grinding apparatus according to claim 48 wherein the means for providing the feed pressure is one or more linear actuators, gears assemblies, pulley systems, counterweights or any combination thereof.

52. (New) The grinding apparatus according to claim 1 wherein the grinding apparatus further has a control system that has a series of interconnected control modules having an operator input panel and a programmable control card module, the control system is adapted to monitor and to automatically adjust one or more operational parameters selected from a group consisting of the feed pressure and the rotational speed of the output drive shaft and a grinding time.

53. (New) The grinding apparatus according to claim 52 wherein the series of interconnected control modules are connected to a multi-function input/output card module that acts as a central communications hub for all the interconnected control modules.

54. (New) The grinding apparatus according to claim 52 wherein the interconnected control modules have one or more programmable microprocessors, microcontrollers or a combination thereof.

55. (New) The grinding apparatus according to claim 54 wherein one or more programmable microprocessors, microcontrollers are replaceable to facilitate modification of a software integral to a functionality of the interconnected control modules.

56. (New) The grinding apparatus according to claim 1 wherein the grinding machine has a pneumatically or hydraulically powered motor.

57. (New) The grinding apparatus according to claim 56 wherein the grinding apparatus has a control system that has a series of interconnected control modules that have an operator input panel and a programmable control card module.

58. (New) A grinding apparatus for grinding working tips of hard metal inserts of rock drill bits, comprising:
a grinding machine,
the grinding machine being equipped with a spindle assembly having an output drive shaft having a longitudinal axis,
grinding tools of different sizes and profiles detachably connected to the output drive shaft for grinding different sizes and profiles of working tips,
means for holding the rock drill bits to be ground and a support system, the support system having means for providing a controlled variable feed pressure up to 350 kilograms based on a size of a connected grinding tool.

59. (New) A method of grinding working tips of hard metal inserts of rock drill bits, comprising:
providing a grinding apparatus having a grinding machine equipped with an output drive having a longitudinal axis and means to detachably retain grinding tools for grinding different sizes and profiles of working tips, speed control means for controlling and varying the speed of rotation of the output drive, and a support system, pressure control means on the support system for controlling and varying feed pressure during grinding and means for holding the rock drill bits to be ground;
inserting a rock drill bit into the means for holding the rock drill bits to be ground,

determining the size and profile of one or more working tips of the same size and profile, and attaching a grinding tool to the grinding machine corresponding to the size and profile of the one or more working tips,

selecting a first rotational speed of the output drive and a first feed pressure,

aligning the grinding tool about the longitudinal axis of said one or more working tips to be ground, grinding said one or more working tips at the first rotational speed and the first feed pressure;

determining the size and profile of one or more other working tips on the same or a different rock drill bit of a second same size and profile, and attaching a grinding tool to the grinding machine corresponding to the size and profile of the one or more other working tips,

selecting a second rotational speed of the output drive and a second feed pressure,

aligning the grinding tool about the longitudinal axis of said one or more other working tips to be ground grinding said one or more other working tips at the second rotational speed and the second feed pressure.

60. (New) The method according to claim 59 wherein the method further comprises the step of reducing the first rotational speed to the second rotational speed when the second size is greater than the first size.

61. (New) The method according to claim 59 wherein the method further comprises the step of increasing the first feed pressure to the second pressure when the second size is greater than the first size.

62. (New) The method according to claim 59 wherein the method further comprises the step of increasing the second pressure to between 115-350 kilograms.

63. (New) The method according to claim 59 wherein the method further comprises the step of reducing the second rotational speed to between 2200-6000 revolutions per minute.

64. (New) The method according to claim 59 wherein the method further comprises varying the rotational speed and the feed pressure during a grinding cycle of a working tip on a rock drill bit.

65. (New) The method according to claim 59 wherein the method further comprises applying the feed pressure along a longitudinal axis of a working tip on a rock drill bit.

66. (New) The method according to claim 59 wherein the method further comprises rotating the output drive shaft at variable speeds from about 1,000 to 11,000 revolutions per minute and providing a variable feed pressure up to 350 kilograms.

67. (New) The method according to claim 59 wherein the method further comprises varying the rotational speed for different sizes and profiles of working tips on a rock drill bit.

68. (New) The method according to claim 59 wherein the method further comprises ramping up the rotational speed to a desired rotational speed for a particular size and profile of a working tip to be ground and thereafter holding a constant rotational speed for a duration of a grinding cycle for a working tip on a rock drill bit.

69. (New) The method according to claim 68 wherein the method further comprises ramping up the rotational speed progressively or in steps to enhance one or more of self-centering, grinding tool cutting performance, grinding

tool longevity and grinding tool profile integrity.

70. (New) The method according to claim 59 wherein the method further comprises ramping up the feed pressure to a desired level for a particular size and profile of a working tip to be ground and thereafter holding the feed pressure constant for the duration of the grinding cycle for the working tip.

71. (New) The method according to claim 70 wherein the method further comprises ramping up the feed pressure progressively or in steps to enhance one or more of self-centering, grinding tool cutting performance, grinding tool longevity and grinding tool profile integrity.

72. (New) The method according to claim 59 wherein the method further comprises varying the rotational speed and varying the feed pressure independently during a grinding cycle of a working tip on a rock drill bit.

73. (New) The method according to claim 67 wherein the method further comprises providing a coolant to a surface of working tips of hard metal inserts during grinding as a flushing medium.

74. (New) The method according to claim 59 wherein the method further comprises using a frequency inverter to vary voltage and frequency to act as a variable electrical power source to optimize power and torque of an electrical motor at any given revolutions per minute.

75. (New) The method according to claim 59 wherein the method further comprises automatically activating a cylinder and providing a biased side load when a table, holding the drill bit to be ground, is tilted.

76. (New) The method according to claim 59 wherein the method further comprises aligning the grinding machine with working tips of hard metal inserts laser line indicators.

77. (New) The method according to claim 59 wherein the method further comprises providing an operator input panel and inputting a size and a profile of the a working tip of a hard metal insert to be ground to a programmable control card module and wherein a control system automatically sets, monitors and adjusts operational parameters selected from a group consisting of the feed pressure, rotational speed and grinding time.

78. (New) The method according to claim 59 wherein the method further comprises providing a control system to progressively increases the feed pressure and rotational speed of a grinding cup on start up.

79. (New) The method according to claim 59 wherein the method further comprises providing a control system that monitors operating characteristics of an electric motor of the grinding machine and utilizes a frequency inverter to vary voltage and frequency to the electric motor to optimize power and torque for a given revolutions per minute.

80. (New) The method according to claim 59 wherein the method further comprises providing a microprocessor and a microcontroller or programmable control card module that are capable of monitoring and automatically adjusting one or more additional operational parameters within a system function selected from a group consisting of coolant flow to a surface of a hard metal insert, coolant flow to an electric motor, output voltage and/or frequency from a frequency inverter to the electric motor, current draw of the electric motor,

biased side load, feed and/or counter balancing pressure, bit positioning, angle of the grinding machine, speed of an orbital rotation motor, speed of a grinder head motor, speed of the output drive shaft or tilting of a table or other support holding the drill bit.

81. (New) The method according to claim 59 wherein the method further comprises using an overall control system and an frequency inverter to automatically control a maximum current drawn by an electric motor during operation in order to protect against overloading and damage to the electric motor.

82. (New) The method according to claim 59 wherein the method further comprises providing a programmable control card module that is capable of providing error reporting, service reminders, forced replacement of worn parts, components or modules or access control.